

Misplaced capsule tension ring in anterior chamber: A unique way of explantation

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We report a patient who presented with endocapsular capsule tension ring (CTR) in iridocorneal angle leading to secondary angle closure glaucoma (ACG) and subsequent removal of the CTR from trabeculectomy ostium. Secondary ACG was diagnosed 2 years and 6 months after cataract surgery in which a CTR was used for zonular instability. CTR removal with trabeculectomy was performed, after which there was the resolution of symptoms. To the best of our knowledge, this is the first case report in which CTR was removed from trabeculectomy ostium. We describe a surgical technique to explant CTR and combining with trabeculectomy.

Key words: Anterior segment, capsular tension ring, cornea, glaucoma, refractive

First introduced in 1991,^[1] the capsule tension ring (CTR) provides support to the capsular bag during partial break-down of zonular support. Common complications with CTR insertion are intraoperative posterior capsular rent (PCR), increase in the size of existing posterior capsular rent, its posterior dislocation or rarely anterior dislocation.^[2,3] In this case report, we describe one such rare complication of CTR as well as its management.

Case Report

A 58-year-old male patient presented with complaints of decreased vision associated with pain in the right eye (RE) postcataract surgery. The patient was operated for RE cataract surgery 2½ years back. The patient gave a history of postoperatively, raised intraocular pressure (IOP) and use of topical antiglaucoma medications (AGM). As IOP was uncontrolled even with topical AGM, he was operated for trabeculectomy. Postfiltering surgery, IOP was still raised.

Hence, he was again started on topical AGM. He had no ocular complaints in the left eye (LE).

When the patient presented to us, his best-corrected visual acuity (BCVA) in the RE was 20/320 (+2.00 DS/-1.50 DC × 90) with IOP of 37 mmHg on Goldmann applanation tonometry which was uncontrolled with four topical AGMs. LE BCVA was 20/50 (+3.50 DS) with IOP of 13 mmHg, which was controlled with single topical AGM. Slit-lamp examination of RE showed elevated bleb superiorly and a patent iridectomy at 12 o'clock with sphincter atrophy of iris from 6 to 11 o'clock, sluggishly reacting pupil with grade 3 RAPD and posterior chamber intraocular lens *in situ*. Slit-lamp examination of LE was within normal limit. Central corneal thickness of RE was 480 microns, and LE was 488 microns. On gonioscopy, the angles were closed for nearly 360°, and the presence of capsule tension ring (CTR) was noted in the iridocorneal angle with the 2 eyelets in the subincisional region at 1 o'clock and 11 o'clock. Internal ostium at 12 o'clock was closed. LE angles were open. On fundus examination, RE had a cup-to-disc ratio of 0.9:1 with bipolar notch and correlating visual field defect [Fig 1]. Rest fundus was within normal limit. LE cup to disc ratio was 0.3:1 with healthy rim and normal fundus. Visual field in left eye was normal. There was neither history of trauma nor there was any evidence of pseudoexfoliation or any syndromic associations (e.g., Marfan, Microspherophakia)

As RE IOP was uncontrolled, oral AGM was added, and the patient was scheduled for RE CTR explantation with repeat trabeculectomy. RE CTR explantation with repeat trabeculectomy was performed [Figs. 2 and 3] after which IOP was 9 mmHg at postoperative day 1 and 5 mmHg at postoperative day 7. Patient's vision remained same, but the patient was relieved from pain and free from AGM. After that patient lost to follow-up.

Surgical technique

As superior trabeculectomy was performed by the primary surgeon, repeat trabeculectomy was planned on the nasal side. In addition, nasal eyelet of CTR was near to 1 o'clock. A limbus-based conjunctival dissection done from 12 o'clock to 3 o'clock and one additional limbal stab incision was made at 11 o'clock. A triangular scleral flap (4 mm × 4 mm) was made and 0.04 mg/ml Mitomycin-C was applied for 2 min to scleral bed. Internal ostium (2 mm × 2 mm) was made with microvitreal blade with primary iridectomy. The anterior chamber (AC) was filled with the sodium hyaluronate ophthalmic surgical device (OVD). CTR was dislocated from an angle structure and eyelet captured with a McPherson forcep and externalized with rotational movement avoiding endothelium. Scleral flap was sutured with 5 (10-0) nylon and conjunctiva was closed with 3 (8-0) vicryl suture. OVD was washed from the AC. At the

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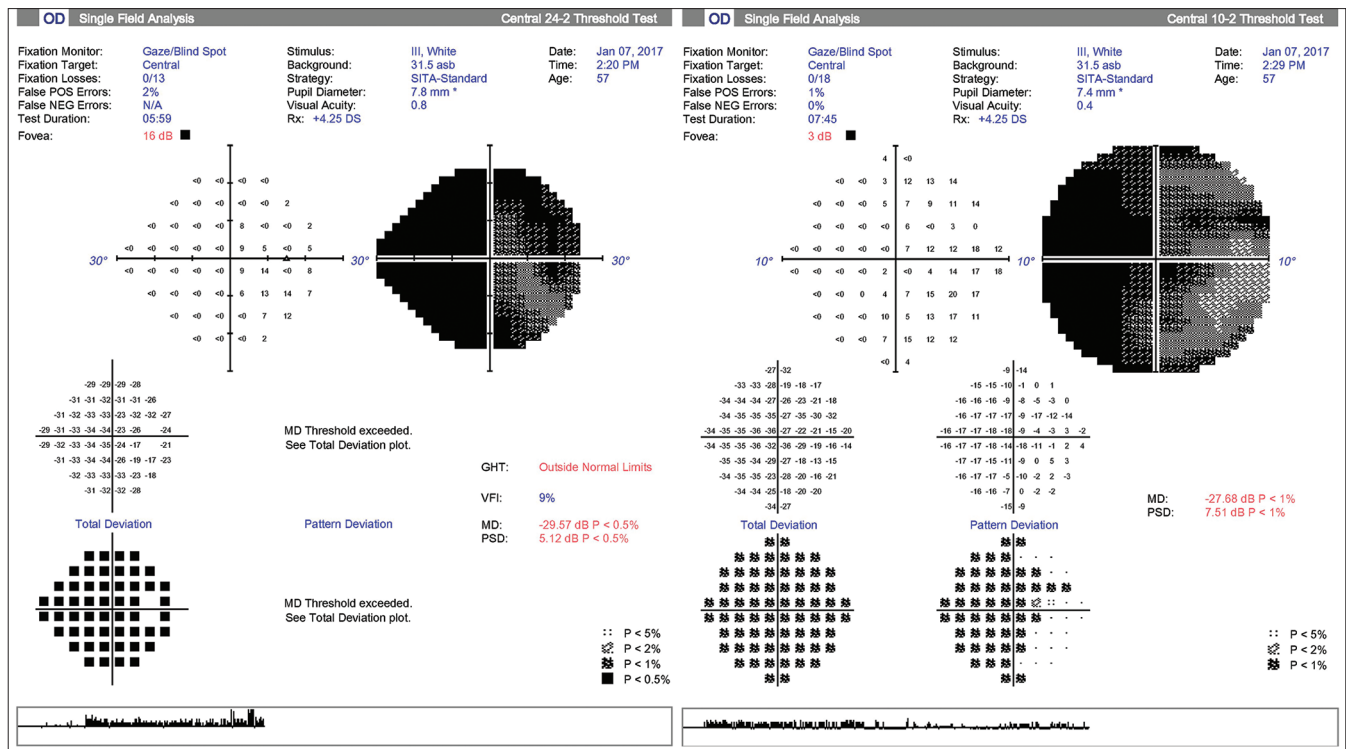


Figure 1: Humphrey visual field analysis of the right eye showing advanced field defect with the involvement of fixation

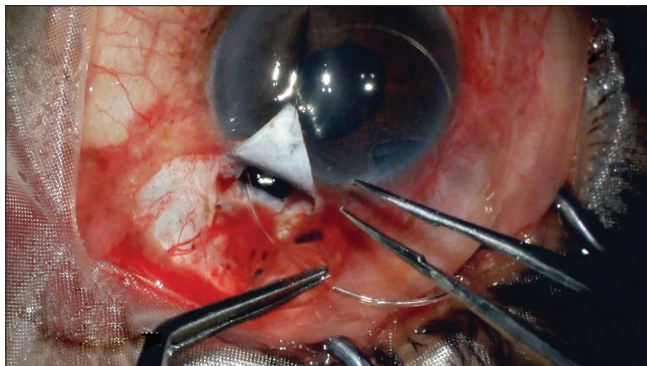


Figure 2: Capsule tension ring dislocated from an angle structure and eyelet captured with a McPherson forcep and externalized with rotational movement avoiding endothelium

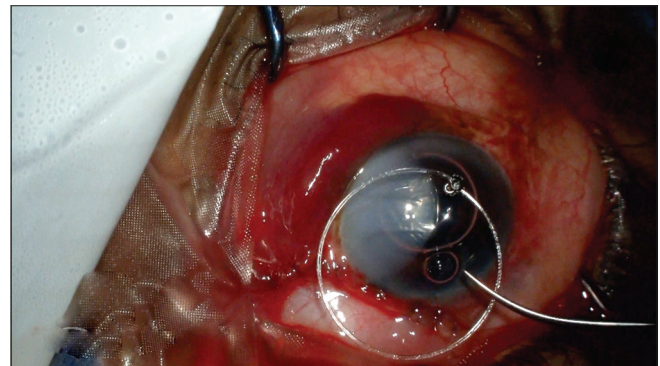


Figure 3: A capsule tension ring was withdrawn. At the end of surgery, anterior chamber was well formed and the pupil was round. Superonasally bleb was sufficiently raised. This case exemplifies the importance of gonioscopy in postcataract surgery raised intraocular pressure patient in whom capsule tension ring was used

end of surgery, bleb formation was noted and AC well formed. Detailed understanding can be made from Video 1.

Discussion

There is a single case report of capsular tension ring deflected into the AC, occluding iridocorneal angle intraoperatively. The presence of CTR was noticed in the early postoperative period and was removed considering long-term complications such as iritis and glaucoma.^[4] In other report, CTR was not occluding angles and managed conservatively.^[5] Mechanism of spontaneous dislocation of CTR in AC has been described by Little *et al.* group.^[4] As per their report, if additional force is applied, the ring can rupture through the capsule into the vitreous or be deflected forward out of the bag and into the AC. Left for long, it can cause raised IOP, thus damaging optic nerve and pathological changes in angle structure.

Our case was diagnosed 2½ years after cataract surgery, and it was not clear whether it was misplaced or deflected into the AC during surgery. Over a period of time, it had caused secondary angle closure, thus leading to secondary glaucoma. As there was nearly 360° angle closure, CTR explantation was combined with trabeculectomy. Postoperatively, intraocular pressure was under control.

Conclusion

To conclude, anterior dislocation of a capsular tension ring is rare, and the mechanism is not clear. Management is not well established as there are only two reported cases. We report a rare complication of the use of a CTR and associated complication and outcomes. This case highlights the importance of detail

glaucoma evaluation in cases with raised IOP postoperatively. We encourage surgeons to consider the capsular tension ring in cases of zonular weakness but suggest using careful implantation technique and be aware of its sequelae.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published, and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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